Kursprov, höstterminen 2013

Mathematics

Delprov D

Elevhäfte

1c

Prov som återanvänds av Skolverket omfattas av sekretess
enligt **17 kap. 4 § offentlighets- och sekretesslagen.**
Detta prov återanvänds av Skolverket t.o.m. **2020-01-31.**

Instructions – Part D

Time for the test

120 minutes for Part D.

Aids

Digital devices, formula sheet and ruler.

Tasks

For most of the tasks in this part it is not enough to only give an answer, you also have to

- show your solutions
- explain/motivate your thinking
- draw figures when required.

For some tasks only the answer needs to be given. They are marked with *"Only answer required"*.

Grading limits

The test (Part A–D) gives a total maximum of 91 points.

Limit for test grade

E: At least 20 points.
D: At least 34 points of which at least 12 points at level C or higher.
C: At least 45 points of which at least 21 points at level C or higher.
B: At least 58 points of which at least 8 points at level A.
A: At least 68 points of which at least 14 points at level A.

Name: _____

Date of birth: _____

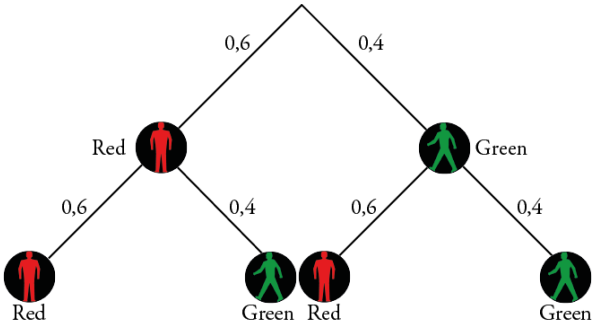
Secondary program: _____ Class: _____

Also write your name, date of birth, secondary program and class on the sheets you hand in.

Illustration: Jens Ahlbom

15. Determine a value for angle v, when $\cos v = 0.718$.
Give your answer with one decimal.
Only answer required. (1/0/0)

16. On her way to the centre, Alex crosses two zebra crossings.
The tree diagram shows the probability of a red light and a green light.
What is the probability that Alex will get a red light exactly once? (1/1/0)



17. At a café, a cup of coffee was SEK 12 in 2007.
What would the cost have been in 2012, if the price followed the CPI?

Year	CPI
2012	314.20
2011	311.43
2010	303.46
2009	299.66
2008	300.61
2007	290.51
2006	284.22

CPI = Consumer price index (0/2/0)

18.

Borrow SEK 2 000 pay SEK 2 455 after 1 month.

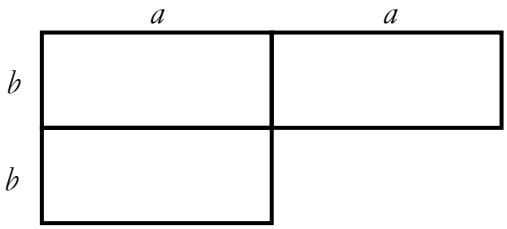
a) Which interest rate, in per cent, is paid on the loan?
Only answer required. (1/0/0)

b) If the loan is not paid back on time, the debt after the first month will amount to SEK 2 455. After yet another month you must pay interest on this amount, at the same percentage rate as for the first month.
How much will you owe after two months? (1/0/0)

c) If the debt is not repaid, it will keep growing in the same way.
How much will you owe one year after borrowing SEK 2 000? (1/1/1)

19. Two six-sided dice are thrown. If the product of the number of dots on both dice is an even number, how great is the probability then that the sum of the dots on both dice is also an even number? (1/1/2)

20. The figure shows a field consisting of three rectangles.
Both *a* and *b* are *positive integers* and they indicate the length of the sides.



a) Write an expression for the perimeter of the entire field.
Only answer required. (1/0/0)

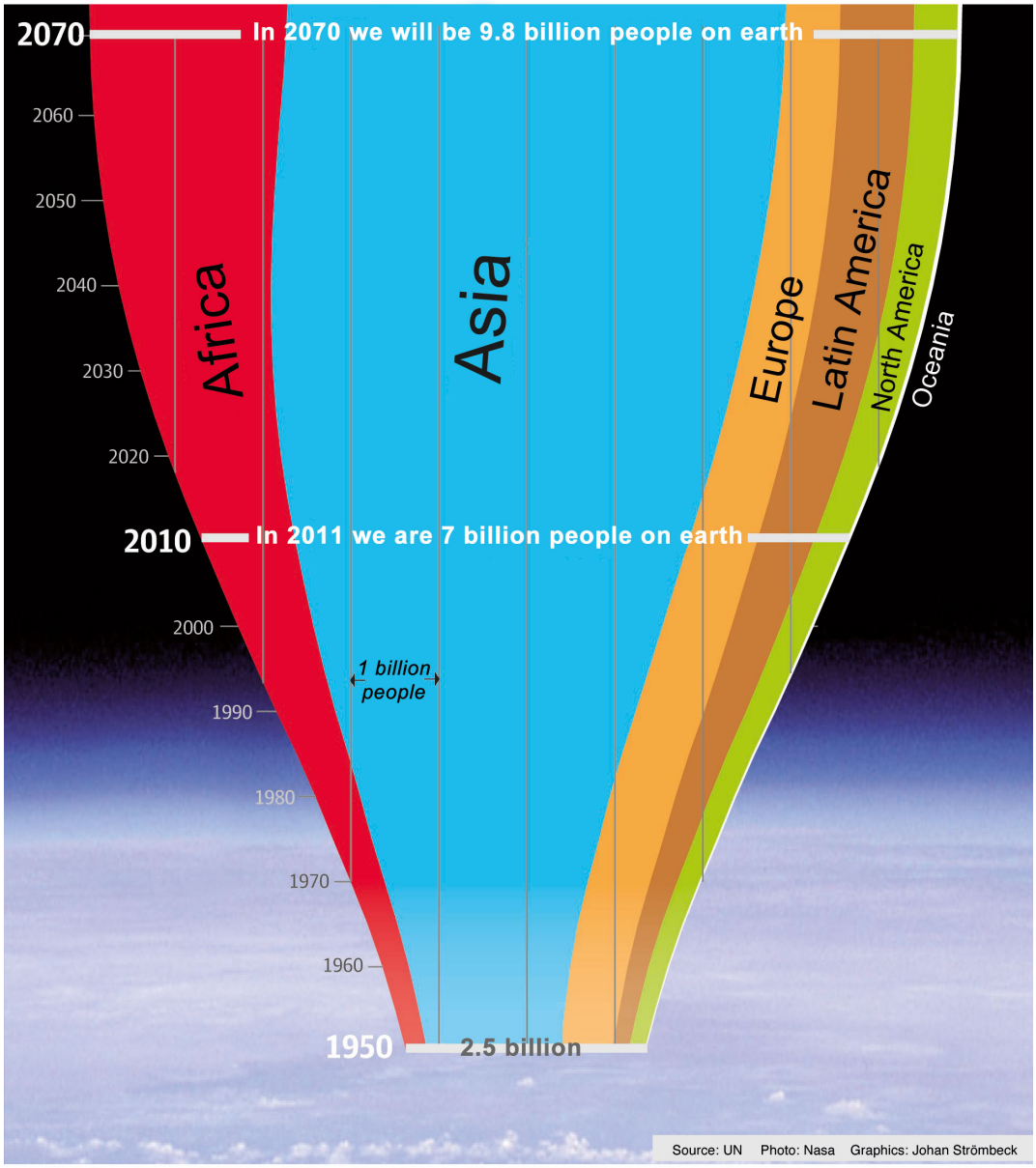
b) Investigate the area of the entire field, if its perimeter is 28 metres. (0/2/3)

21. On November 30 2011, the population on earth reached 7 billion people. The diagram shows the change in the number of people on earth at a given period in time.

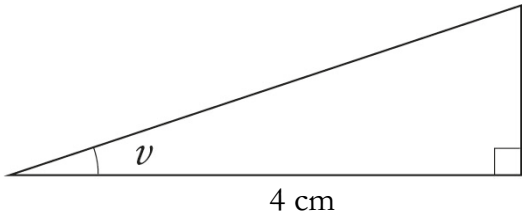
a) Using the diagram, estimate how big a part of the population was living in Asia in 2011. (2/0/0)

b) By how many per cent did the population on earth increase between 1950 and 2011? (1/1/0)

c) Determine the relationship between the estimated percentage change in the population between 2010 and 2070 and the percentage change in the population between 1950 and 2010. What does this tell you about the change in population? (0/2/1)



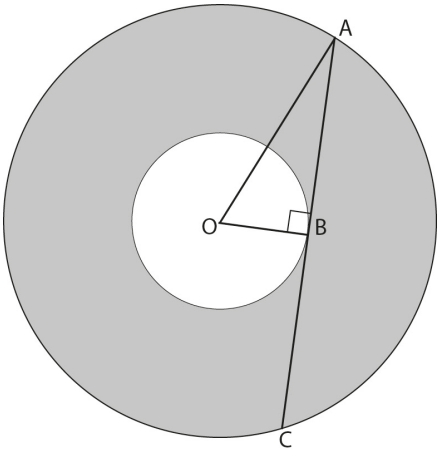
22.



In this right-angled triangle, one of the other angles is v (see figure).
The adjacent is 4 cm long.

a) State the area A of the triangle as a function of the angle v. (0/2/1)

b) Determine the domain of the function. (0/1/1)

c) Discuss how the area could vary. (0/1/1)

23. Oskar claims to be able to calculate the area of the shaded field by taking the square root of the distance AB and multiply it by pi (π).
The line AC is tangent to the small circle in point B.
O is the centre of the circle. Show that he is right. (1/2/3)